

## REMARKS

By the present reply, no claims have been added, cancelled or amended. Accordingly, claims 55, 58 and 60–131 are presently pending, of which claims 55, 115 and 116 are the independent claims. Rejoinder of claims 76-114 and 117-131, which presently stand withdrawn from consideration, is respectfully requested pursuant to 37 C.F.R. § 1.141, as discussed in greater detail below. Accordingly, favorable reconsideration and allowance of claims 55, 58 and 60–131 is respectfully requested.

Applicants wish to thank the Examiner for having withdrawn the rejection of the independent claims (claims 55, 115 and 116) under 35 U.S.C. § 103(a) as being obvious over Grossman in view of Nodwell.

Applicants also wish to thank the Examiner for having withdrawn the final status of the previous Office Action.

### **35 U.S.C. § 102(b): Grossman**

The Examiner has rejected claims 55, 58, 60-62, 66, 71, 115 and 116 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,963,783 to Grossman ("Grossman").

### **Previous Office Actions and Responses have Already Established that Grossman does Not Anticipate Independent Claims 55, 115 and 116**

Applicants respectfully remind the Examiner that the prosecution history of the present application has already conclusively established that the Grossman reference does not anticipate independent claims 55, 115 and 116 as previously amended.

In the non-final Office Action mailed April 8, 2008, the Examiner had rejected claims 55, 56, 58, 60-62, 66, 71, 115 and 116 under 35 U.S.C. § 102(b) as being anticipated by Grossman. In response, Applicants amended independent claims 55, 115 and 116 to include the limitations of claim 57 as well as limitations similar to those of claim 59, in view of the fact that the Examiner had not rejected either claim 57 or claim 59 as anticipated by Grossman. On the contrary, it is clear from page 8 of the April 8, 2008 Office Action that the Examiner concluded that Grossman does not disclose the limitations of original claims 57 and 59 which are now recited in independent claims 55, 115 and 116, specifically, the limitations that the flow generator comprises a conductor (from original claim 57) and that the electrical connection comprises the flow generator (from original claim 59).

In the next Office Action mailed on January 27, 2009, the Examiner did not reject the amended independent claims as anticipated by Grossman, but rather, rejected the independent claims as obvious over Grossman in combination with Nodwell. With respect to independent claim 55, on page 3 of the January 27, 2009 Office Action, the Examiner expressly stated that,

"Grossman does not specifically disclose the flow generator having an electrical conductor, and that the electrical connection comprises the electrical conductor."

Thus, in the Office Actions mailed April 8, 2008 and January 27, 2009, the Examiner has already expressly concluded that the Grossman reference does **not** anticipate independent claims 55, 115 and 116 as previously amended. In contrast, the present Office Action contradicts the Examiner's previous view by rejecting the independent claims as anticipated by Grossman. Applicants respectfully agree with the Examiner's conclusion in the April 8, 2008 and January 27, 2009 Office Actions that the Grossman reference does not anticipate independent claims 55, 115 and 116, and respectfully disagree with the contradictory position taken in the present Office Action.

Grossman fails to anticipate the independent claims

Applicants respectfully submit that the Grossman reference fails to satisfy the requirements for a finding of anticipation of independent claims 55, 115 and 116. In this regard, the standard for an anticipation rejection under 35 U.S.C. §102 has been well established by the Court of Appeals for the Federal Circuit, and is summarized in M.P.E.P. § 2131:

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). “When a claim covers several structures or compositions, either generically or as alternatives, the claim is deemed anticipated if any of the structures or compositions within the scope of the claim is known in the prior art.” *Brown v. 3M*, 265 F.3d 1349, 1351, 60 USPQ2d 1375, 1376 (Fed. Cir. 2001) ... “The identical invention must be shown in as complete detail as is contained in the ... claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).

Independent claim 55 as previously amended recites:

55. An apparatus for producing electromagnetic radiation, the apparatus comprising:
  - a) an electrically insulated flow generator configured to generate a flow of liquid along an inside surface of an envelope, wherein said electrically insulated flow generator

comprises an electrical conductor and electrical insulation surrounding said conductor;

- b) first and second electrodes configured to generate an electrical arc within the envelope to produce the electromagnetic radiation; and
- c) an electrical connection to the first electrode, wherein said electrical connection comprises said conductor of said electrically insulated flow generator, and wherein said electrical insulation surrounds said first electrode and said conductor.

Applicants respectfully submit that Grossman fails to disclose “an electrically insulated flow generator configured to generate a flow of liquid along an inside surface of an envelope, wherein said electrically insulated flow generator comprises an electrical conductor and electrical insulation surrounding said conductor”, and “an electrical connection to the first electrode, wherein said electrical connection comprises said conductor of said electrically insulated flow generator, and wherein said electrical insulation surrounds said first electrode and said conductor”, as recited in claim 55 as previously amended.

For the Examiner's convenience, the following summary of Grossman has been reproduced from Applicants' October 8, 2008 response:

The primary reference, Grossman, generally discloses the use of a fluid heat transfer medium to control the pressure of mercury vapor within a mercury vapor lamp, in order to control both the bandwidth and intensity of the lamp output. (Abstract.)

More particularly, in order to successfully use a mercury lamp as the excitation source for photochemical separation of a single isotope, the spectral bandwidth of the mercury lamp must be sufficiently narrow that it excites only

the specific isotope of interest, and not other isotopes. The spectral bandwidth of the lamp is strongly dependent upon the vapor equilibrium pressure of the mercury used in the lamp. As a result, variations in mercury vapor pressure within the lamp can cause disturbances in the linewidth and intensity of radiation emitted by the lamp, resulting in unintended stimulation of undesirable isotopes rather than the desired isotope, and the rate of separation of the desired isotope may also be affected. According to Grossman, previous systems were not able to adequately control the mercury vapor pressure inside the lamps, resulting in insufficient control of the spectral bandwidth of the lamps. This problem is due to temperature variations in the lamp, and in particular, the "cold spot", which determines the equilibrium vapor pressure within the lamp (col. 1, lines 19-51).

Grossman addresses this problem by controlling the equilibrium mercury vapor pressure within the lamp envelope, in order to establish the desired spectral linewidth of emitted radiation. Grossman achieves this by establishing and controlling a temperature zone, by surrounding at least a section of the lamp envelope with an outer, elongated cylindrical tube which serves to define a heat transfer region. A heat transfer medium, preferably water, is circulated at a controlled temperature through the heat transfer region, thereby regulating the temperature of the lamp envelope. Controlling the temperature of the envelope allows the equilibrium mercury vapor pressure contained within the envelope to be controlled, thereby allowing control of the bandwidth and intensity of radiation emitted by the lamp (col. 2, lines 35-52).

Thus, with reference to Figure 1, Grossman discloses a mercury lamp 20 comprising an inner lamp envelope 2 and an outer jacket 3, both constructed of quartz. The inner envelope 2 has tubes 11 at each end to contain the electrodes and to provide regions for mounting the inner envelope 2 within the outer jacket 3. The tubes 11 of the inner envelope 2 are separated from the outer jacket 3 with spacers 10, which have openings to allow water to travel through the space between the inner envelope 2 and the outer jacket 3. A tapered stopper 4, typically of an elastomeric material, is disposed at each end

of the outer jacket 3 and serves to center the outer jacket 3 around the envelope 2. Each tapered stopper 4 also guides and positions an electrode lead 5 through the stopper and the outer jacket 3 into the envelope 2 where it provides current for the electrodes 6. The two tapered stoppers 4 also contain openings through their centers which provide for an inlet 7 stream and an outlet 8 stream of circulating water, which circulates over the outer surface of the inner discharge envelope 2, travelling in the space between the inner envelope 2 and the outer jacket 3, through the openings in the spacers 10. (Fig. 1 and col. 4, lines 24-64).

Regarding the “electrically insulated flow generator” recited in amended claim 55, the present Office Action on page 2 compares this element of claim 55 to an unspecified element or elements of Grossman described as follows:

“(not specifically referenced in figure 1, the portion that surrounds an inner envelope 2, and column 4, lines 24-29 and 52-56)”.

Respectfully, however, Applicants are uncertain as to which element(s) of Grossman were intended to be identified by this passage of the Office Action.

The “portion that surrounds an inner envelope 2” appears to be the outer jacket 3. However, this outer jacket 3 is not a “flow generator configured to generate a flow of liquid along an inside surface of an envelope” as recited in claim 55. Rather, the outer jacket 3 appears to be the only structure disclosed by Grossman that could be compared to the “envelope” itself recited in this passage of claim 55. Thus, the structure identified in the Office Action appears to correspond to an “envelope”, and not to a flow generator configured to generate a flow of liquid along an inside surface of the envelope as recited in claim 55.

Accordingly, in determining whether Grossman discloses a “flow generator” as recited in claim 55, it is necessary to identify which structure(s) (if any)

disclosed by Grossman acts as a “flow generator configured to generate a flow of liquid along an inside surface of” the outer jacket 3.

In this regard, it appears that the elements of Grossman that are comparable to a “flow generator” are the tapered stoppers 4 shown in figure 1. Grossman discloses at column 4, lines 50-52 that,

“The tapered stoppers also contain openings in their centers which provide for an inlet 7 and outlet 8 stream of circulating heat transfer medium which is preferably water.”

Thus, in Grossman, it is the tapered stopper 4 shown at the left side of Figure 1 that appears to act as a flow generator. The opening in the center of the tapered stopper 4 provides a flow of liquid in the form of an inlet 7 stream of circulating water. By way of comparison to Applicants’ specification, the opening in the center of the tapered stopper 4 shown in Figure 1 of Grossman to generate the inlet 7 stream of water may be compared in some ways (and contrasted in others) to the conduit entering the flow generator 150 via the liquid inlet port 154 and exiting the flow generator 150 via the plurality of holes 348, 350 of the flow generator 150, to generate a vortexing flow of liquid along an inside surface of an envelope, as discussed in Applicants’ specification at page 40, line 18 to page 41, line 7 (para. [0172] of US 2005/0179354), for example.

(If the Examiner intended to compare some structure other than the outer jacket 3 or the tapered stopper 4 of Grossman to the “electrically insulated flow generator” recited in claim 55, the Examiner is respectfully requested to specifically identify the structure in question and to explain how it is “configured to generate a flow of liquid along an inside surface of an envelope” as recited in claim 55.)

On pages 2-3 of the present Office Action, the Examiner has compared the electrode lead 5 of Grossman to the “electrical conductor” recited in claim 55.

However, Applicants respectfully note that claim 55 recites that “said electrically insulated flow generator comprises an electrical conductor”. It is clear from Grossman that the tapered stopper 4, which as discussed above appears to correspond to a flow generator, does not “comprise” the electrode lead 5. Rather, the tapered stopper 4 and the electrode lead 5 are separate elements: as disclosed at col. 4, lines 43-45, “the tapered stopper guides and positions an electrode lead 5 through both the stopper and the outer jacket, and into the envelope ...”. Accordingly, although the electrode lead 5 is an electrical conductor, Grossman fails to disclose that the tapered stopper 4 comprises the electrode lead 5.

Similarly, to the extent that the Examiner may have initially compared the outer jacket 3 (the “portion that surrounds an inner envelope 2”) to the claimed flow generator, it is equally clear that the outer jacket 3 does not comprise the electrode lead 5. Likewise, Grossman fails to disclose any other “flow generator” structure that “comprises” the electrode lead 5.

More generally, it is clear that the tapered stopper 4 does not comprise an electrical conductor. Rather, Grossman specifically states that the stopper 4 is typically composed of an elastomeric material (col. 4, lines 40-41), which by definition is an elastic polymer such as rubber or plastic material, and which would not be electrically conductive.

Accordingly, Grossman fails to disclose that “said electrically insulated flow generator comprises an electrical conductor” as recited in subparagraph (a) of claim 55. Although Grossman may disclose structure comparable to a flow generator, that structure does not comprise any electrical conductor. Conversely, although Grossman discloses an electrode lead 5 which is a conductor, Grossman fails to disclose any flow generator structure that comprises the electrode lead 5.

It follows from the above that Grossman also fails to disclose that “said electrical connection [to the first electrode] comprises said conductor of said



electrically insulated flow generator" as recited in subparagraph c) of claim 55, because Grossman fails to disclose a flow generator that comprises a conductor.

For the above reasons alone, Grossman fails to satisfy the above-noted requirements for a finding of anticipation of claim 55 as previously amended. However, Applicants also respectfully note that Grossman fails to disclose other limitations of claim 55 as well.

In this regard, claim 55 recites in subparagraph (a) that "said electrically insulated flow generator comprises an electrical conductor and electrical insulation surrounding said conductor", and further recites in subparagraph (c) that, "said electrical insulation surrounds said first electrode and said conductor". Regarding the "insulation" limitations of claim 55, on pages 2-3 of the Office Action, the Examiner has compared the electrode lead 5 of Grossman to the "conductor" recited in claim 55, and has stated that "the flow of liquid is water; thus, in order not to short circuit the conductor from other conductors within the flow generator, it is inferred that the conductor 5 is surrounded by electrical insulation". Applicants assume that the Examiner is simply inferring that portions of the electrode leads 5 that extend through water before entering the sealed inner envelope 2 are insulated wires, comprising a conductive core tightly enclosed in an insulative sheath (not shown or disclosed in Grossman). However, even if this were true, it is clear that such an insulative sheath could not surround the entire electrode 6: if the insulative sheath were to surround the entire electrode 6, then the electrode 6 would be insulated from the other electrode 6 and it would not be possible to establish an electric current between the two electrodes. Therefore, it is clear that any such inferred insulative sheath around the electrode lead 5 does not surround the electrode as recited in claim 55. In other words, Grossman does not disclose that "said electrically insulated flow generator comprises an electrical conductor and electrical insulation surrounding said conductor ... wherein said electrical insulation surrounds said first electrode and said conductor", as recited in claim 55.

For this additional reason, Applicants respectfully submit that the Grossman reference fails to satisfy the requirements for a finding of anticipation of claim 55 as previously amended.

Claims 58, 60-62, 66 and 71 are directly or indirectly dependent upon claim 55. Applicants therefore respectfully submit that these claims are allowable due to their dependencies, as well as the additional subject-matter that each of these claims recites.

Independent claims 115 and 116 were previously amended to recite limitations similar to those discussed above in connection with previously amended claim 55. Applicants therefore respectfully submit that the Grossman reference fails to satisfy the requirements for a finding of anticipation of claims 115 and 116, for reasons including those presented above in connection with claim 55.

**35 U.S.C. § 103(a)**

The Examiner has rejected the following dependent claims under 35 U.S.C. § 103(a) as being unpatentable over the following references:

- claims 63 – 65 over Grossman in view of U.S. Patent No. 6,214,034 to Azar;
- claims 67 and 68 over Grossman in view of U.S. Patent No. 5,753,106 to Schenck;
- claims 69, 70 and 75 over Grossman;
- claim 72 over Grossman in view of U.S. Patent No. 6,621,199 to Parfeniuk;
- claim 73 over Grossman in view of U.S. Patent No. 5,137,659 to Ashley; and

- claim 74 over Grossman in view of U.S. Patent No. 6,465,799 to Kimble.

Claims 63-65, 67-70 and 72-75 are directly or indirectly dependent upon claim 55, which has been shown to be allowable under the preceding heading. Applicants therefore respectfully submit that claims 63-65, 67-70 and 72-75 are allowable due to their dependencies, as well as the additional subject-matter that each of these claims recites.

**Election / Restrictions: Request for Rejoinder of claims 76-114 and 117-131**

Rejoinder of claims 76-114 and 117-131, which are presently pending but withdrawn from consideration, is respectfully requested pursuant to 37 C.F.R. § 1.141.

In this regard, claims 76-114 and 117-119 are directly or indirectly dependent upon independent claim 55, while claims 120-131 are directly or indirectly dependent upon independent claim 116.

Applicants respectfully submit that independent claims 55 and 116 are both generic to all relevant species to which their dependent claims 58, 60-114 and 117-131 pertain, and therefore, claims 55 and 116 are both linking claims as discussed in M.P.E.P. § 809.03.

As independent claims 55 and 116 have been shown to be allowable, applicants respectfully request that their dependent claims 76-114 and 117-131 be rejoined in this application and allowed, pursuant to 37 C.F.R. § 1.141.

### **Fee Authorization**

Applicants hereby respectfully petition for a one-month extension of time, until September 14, 2009, for responding to the Office Action mailed May 14, 2009. The required extension fee of \$130 is transmitted herewith by EFS-Web. The Commissioner is hereby authorized to charge any additional fees that may be required, including any fees for extensions of time, or credit any overpayment, to our deposit account no. 11-1410.

### **Conclusion**

In view of the foregoing, Applicants respectfully submit that the present application is in condition for allowance, and respectfully request that a Notice of Allowance be issued.

Applicants respectfully note that since the present application was filed more than five and a half years ago on Feb. 12, 2004, the Examiner has issued six Office Actions on the merits (eight Office Actions in total). The six Office Actions on the merits have cited various combinations of references stemming from five successive searches of the prior art conducted by the Examiner. Applicants respectfully submit that the Examiner has done a thorough and commendable job of searching for prior art pertinent to the present application, and respectfully submit that no further searching is required. Should the Examiner accept the foregoing submissions, Applicants respectfully request timely allowance of the present application.

Although the present communication may include alterations to the application or claims, or characterizations of claim scope or referenced art, Applicant is not conceding in this application that previously pending claims are not patentable over the cited references. Rather, any alterations or characterizations are being made to facilitate expeditious prosecution of this application. Applicant reserves the right to pursue at a later date any

previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution. Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that Applicant has made any disclaimers or disavowals of any subject matter supported by the present application.

Should there be any questions concerning this application, the Examiner is respectfully invited to contact the undersigned agent at the telephone number appearing below. Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to deposit account No. 11-1410.

Respectfully submitted,

Knobbe, Martens, Olson & Bear

Dated: Sept. 14, 2009

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